CSE- 4027 Ex: 6 Assignment

Academic year: 2020-2021 **Semester:** WIN

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Descriptive Statistics Using R language

· Find Mean, Median, Mode, Range, Interquartile Range (IQR), Standard deviation, Variance

```
> str(mtcars)
```

```
'data.frame':	32 obs. of  11 variables:
 $ mpg : num  21 21 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 ...
 $ cyl : num  6 6 4 6 8 6 8 4 4 6 ...
 $ disp: num  160 160 108 258 360 ...
 $ hp  : num  110 110 93 110 175 105 245 62 95 123 ...
 $ drat: num  3.9 3.9 3.85 3.08 3.15 2.76 3.21 3.69 3.92 3.92 ...
 $ wt  : num  2.62 2.88 2.32 3.21 3.44 ...
 $ qsec: num  16.5 17 18.6 19.4 17 ...
 $ vs  : num  0 0 1 1 0 1 0 1 1 1 ...
 $ am  : num  1 1 1 0 0 0 0 0 0 0 ...
 $ gear: num  4 4 4 3 3 3 3 4 4 4 ...
 $ carb: num  4 4 1 1 2 1 4 2 2 4 ...
```

```
>
>
> mat <- matrix(rnorm(30), nrow=5, ncol=6)
> mean(mat[,2])
```

```
[1] -0.1366864
```

```
> mean(mat[2,])
```

```
[1] 0.1433584
```

```
>
> apply(mat, 2, median)
```

```
[1]  0.509022127  0.061203681 -0.182226095  0.544950130
```

```
[5] -0.111411539 -0.001963405
```

```
> apply(mat,1,median)[1:2]
```

```
[1] -0.05668747  0.20976103
```

```
>
> #  Measures
> mean(mtcars$mpg)
```

```
[1] 20.09062
```

```
> median(mtcars$mpg)
```

```
[1] 19.2
```

```
>
> #with quantile function
> quantile(mtcars$mpg.Length, 0.5)
```

```
50%
 NA
```

```
>
> #Standard deviation and variance
> sd(mtcars$mpg)
```

```
[1] 6.026948
```

```
> var(mtcars$mpg)
```

```
[1] 36.3241
```

```
> mad(mtcars$mpg)
```

```
[1] 5.41149
```

```
> max(mtcars$mpg, na.rm = TRUE)
```

```
[1] 33.9
```

```
> min(mtcars$mpg, na.rm = TRUE)
```

```
[1] 10.4
```

```
> sum(mtcars$mpg)
```

```
[1] 642.9
```

```
> length(mtcars$mpg)
```

```
[1] 32
```

```
>
> #using lapply() to compute the standard deviation (or variance) of multiple
variables at the same time
> lapply(mtcars[, 1:4], sd)
```

```
$mpg
[1] 6.026948

$cyl
[1] 1.785922

$disp
[1] 123.9387

$hp
[1] 68.56287
```

```
>
> #Coefficient of variation
> sd(mtcars$mpg.Length) / mean(mtcars$mpg.Length)
```

```
[1] NA
Warning message:
In mean.default(mtcars$mpg.Length) :
  argument is not numeric or logical: returning NA
```

```
>
> #Mode
> tab <- table(mtcars$mpg.Length) # no.of occurrences for each unique value
> sort(tab, decreasing = TRUE) # sorting highest to lowest
integer(0)
```

```
> #Interquartile range
> IQR(mtcars$mpg.Length)
```

```
[1] NA
```

```
> quantile(mtcars$mpg.Length, 0.75) - quantile(mtcars$mpg.Length, 0.25)
```

```
75%
 NA
```

```
>
> # Cumulative measures
>
> a <- c(1:9,4,2,4,5:2)
> cumsum(a)
```

```
 [1]  1  3  6 10 15 21 28 36 45 49 51 55 60 64 67 69
```

```
> cummax(a)
```

```
 [1] 1 2 3 4 5 6 7 8 9 9 9 9 9 9 9 9
```

```
> cummin(a)
```

```
 [1] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
```

```
> cumprod(a)
```

```
 [1]       1       2       6      24     120
 [6]     720    5040   40320  362880 1451520
[11] 2903040 11612160 58060800 232243200 696729600
[16] 1393459200
```

```
>
> # Row and Column in R
> rowMeans(mtcars[2,])
```

```
Mazda RX4 Wag
     29.98136
```

```
> rowSums(mtcars[2,])
```

```
Mazda RX4 Wag
     329.795
```

```
> colMeans(mtcars)
```

```
       mpg        cyl       disp         hp       drat
 20.090625   6.187500 230.721875 146.687500   3.596563
        wt       qsec         vs         am       gear
  3.217250  17.848750   0.437500   0.406250   3.687500
      carb
  2.812500
```

```
> colSums(mtcars)
```

```
     mpg      cyl     disp       hp     drat       wt
 642.900  198.000 7383.100 4694.000  115.090  102.952
    qsec       vs       am     gear     carb
 571.160   14.000   13.000  118.000   90.000
```